

KOSTYUK, P.G.; SOROKINA, Z.A.; SHAPOVALOV, A.I.

Intracellular recording of muscle fiber potentials; rhythmic activity.
Biofizika, 4 no.3:310-319 '59 (MIRA 12:7)

1. Institut fiziologii zhivotnykh pri Kiyevskom gosuniversitete.
(MUSCLES, physiol.
rhythmicity of musc. fiber potential, intracellular
recording (Rus))

SOROKINA, Z.A. [Sorokina, Z.O.]

Relation between the rest potential of striated muscle fibers
and the external concentration of K^+ , Na^+ and Cl^- ions. *Fiziol.*
zhur. [Ukr.] 5 no.4:451-460 J1-Ag '59. (MIRA 12:11)

1. Institut fiziologii AN USSR, laboratoriya obshchey fiziologii.
(BODY FLUIDS) (ELECTROLYTES) (PERMEABILITY)

SOROKINA, Z.A.

Role of metabolism in rest potential maintenance of striated
muscle fibers. Fiziol.zhur. 45 no.11:1359-1366 N '59. (MIRA 13:5)

1. From the Bogomolets Institute of Physiology, Ukrainian S.S.R.
Academy of Sciences, Kiev.
(MUSCLES physiol.)

SOROKINA, Z. A.; KOSTYUK, P. G.

"On the Mechanism of Hydrogen Ion Distribution between Cell Protoplasm and Medium."

report submitted for the Symposium on Membrane Transport and Metabolism, Prague, Czech., 22-26 August 1960.

Inst. of Physiology, Acad of Sci of the Ukrainian SSR, Kiev.

LEBEDEVA, Z.A.; SOROKINA, Z.A.; BUSURINA, I.V.; KUZNETSOVA, Ye.S.

The nature of healing in osteoarticular tuberculosis in adults.
Probl.tub. 38 no.6:31-36 '60. (MIRA 13:11)

1. Iz kostnotuberkuleznogo otdeleniya dlya vroslykh (zav. Z.A. Lebedeva) Instituta tuberkuleza AMN SSSR (dir. - chlen-korrespondent AMN SSSR prof. N.A. Shmelev).
(BONES--TUBERCULOSIS)

SOROKINA, Z.A., kand.med.nauk

Late results of treating tuberculosis of the bones and joints
in adults. Probl.tub. 38 no.7:60-64 '60. (MIRA 14:1)

1. Iz Instituta tuberkuleza (dir. - chlen-korrespondent AMN SSSR
prof. N.A. Shmeleva, zav. otdeleniyem - kand.med.nauk Z.A. Lebedeva)
AMN SSSR.

(BONES---TUBERCULOSIS)

SOROKINA, Z.A. (Kiyev); LIMANSKIY, Yu.P. (Kiyev)

Third All-Union Conference on the Electrophysiology of the Nervous
System. Fiziol. zhur. 46 no.11:1423-1425 N '60. (MIRA 13:11)
(ELECTROPHYSIOLOGY--CONGRESSES) (NERVOUS SYSTEM)

SOROKINA, Z. A.

Cand Biol Sci - (diss) "Problem of physico-chemical and metabolic mechanisms of the formation of the dormancy potential of cross-striated muscle fiber." Kiev, 1961. 14 pp; (Ministry of Higher and Secondary Specialist Education Ukrainian SSR, Kiev Order of Lenin State Univ imeni T. G. Shevchenko); 150 copies; price not given; list of author's works on p 14 (12 entries); (KL, 7-61 sup, 228)

SOROKINA, Z.A.

Relationship between intracellular and extracellular pH, the rest potential and potassium-ion concentration in the striated muscle fiber of a frog. Tsitol'ogiia 3 no. 1:48-59 Ja-F '61. (MIRA 14:2)

1. Laboratoriya obshchey fiziologii Instituta fiziologii AN
USSR, Kiev (ELF) (HYDROGEN-ION CONCENTRATION)
IN THE BODY

SOROKINA, Z.A. [Sorokina, Z.O.]; LIMANSKIY, Yu.P. [Limans'kiy, Yu.P.]

Third Conference on Problems of Electrophysiology. Fiziol. zhur.
[Ukr.] 7 no.1:151-153 Ja-F '61. (MIRA 14:1)
(ELECTROPHYSIOLOGY--CONGRESSES) (NERVOUS SYSTEM)

NIKITENKO, V.F. [Nikytenko, V.F.]; PYATIGORSKIY, B.Ya. [P'aityhorn'kiy, B.IA.];
SOROKINA, Z.A. [Sorokina, Z.O.]

Electrometric amplifier in using high-ohm glass microelectrodes.
Fiziol. zhur. [Ukr.] 10 no.3:407-409 My-Je '64. (MIRA 18:9)

1. Laboratoriya obshchey fiziologii Instituta fiziologii im. A.Bogomol'tsa
AN UkrSSR, Kiyev.

SOROKINA, Z.A.

Role of calcium ions in maintaining the rest potential of striated muscle fibers. Fiziol. zhur. 50 no.3:340-347 Mr '64. (MIRA 18:1)

1. Institut fiziologii imeni A.A. Bogomol'tsa AN UkrSSR, Kiev.

SGROKINA, Z.A.

Method for measuring the activity of potassium and sodium ions
within cells. Biul.eksp.biol.i med. 58 no.10:119-122 0 '64.
(MIRA 18:12)

1. Laboratoriya obshchey fiziologii (zav. - prof. P.G.Kostyuk)
Instituta fiziologii imeni Bogomol'tsa (dir. - akademik AN
UkrSSR A.F.Makarchenko) AN UkrSSR, Kiyev. Submitted February 24,
1964.

SOROKINA, E.A.

Measuring the hydrogen ion activity outside and inside ganglial
nerve cells in mollusks. Zhur. evol. biokhim. i fiziol. 1
no.4:343-350 J1-Ag '65. (MIRA 18:8)

1. laboratoriya obshchey fiziologii Instituta fiziologii
imeni A.A. Bogomol'tsa AN UkrSSR, Kiyev.

RYBCHINSKAYA, Ye.M., kand.meditsinskikh nauk (Odessa); SOROKINA, Z.N.,
nauchnyy sotrudnik (Odessa)

Dynamic investigations of the unconditioned salivation reaction in
hypertension patients following prescribed walking as part of the
total complex of health resort treatment. Vrach. delo no.9:127-129
S '60. (MIRA 13:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut kurortologii.
(HYPERTENSION) (WALKING) (SALIVA)

Sorokina, Z. Ye.

USSR /Chemical Technology. Chemical Products
and Their Application

I-27

Wood chemistry products. Cellulose and its
manufacture. Paper.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 32657

Author : Sorokina Z. Ye.

Inst : Khabarovsk State Pedagogical Institute

Title : Turpentine and Rosin from Exudates of Branches
of Common Pine

Orig Pub: Uch. zap. Khabarov. gos. ped. in-t, 1956, 1, 109-
111

Abstract: The content of rosin and turpentine in resinous
exudates ("bumps") formed on branches of common
pine (in the Amur Oblast') by the action of the

Card 1/2

USSR /Chemical Technology. Chemical Products
and Their Application

I-27

Wood chemistry products. Cellulose and its
manufacture. Paper.

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 32657

fungus Cronartium quercus (Brand) Schroet, is
of 34.3 and 8.4%, respectively. The turpentine
had d_4^{20} 0.8645, n_D^{20} 1.4695, $(\alpha)_D^{20}$ +18.2,
boiling starts at 156°/761 mm Hg, 97% distil up
to 182°; indices of the rosin: acid value 160,
saponification value 166, softening point accord-
ing to the method of Kremer-Sarnov 64°, content
of unsaponifiabiles 8.5%.

Card 2/2

Sorokina, Z. Ye

Isolation of the active principle of water hemlock. I.
Z. B. Sorokina. *Vsesoyuz. Zapiski Khimichesk. Gosudarst.
Pedagog. Inst.* 1, 112-16 (1956); Referat. *Zhur. Khim.
Biol. Khim.* 1957. Abstr. No. 16613. — The active prin-
ciple of the water hemlock was found to be an unsatd. compd.
(I) free from N₂S and halides and possessing reducing prop-
erties. I was a glucoside, which was isolated as a powder
after extr. by 80% EtOH and pptn. by MeOH. Hy-
drolysis did not destroy its toxic properties. B. S. L.

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SOROKINA, Z.Ye.

Turpentine and colophony from burls on the branches of the
Scotch pine. Soob.DVFAN SSSR no.9:130-133. '58. (MIRA 12:4)
(Amur Province--Scotch pine) (Turpentine) (Gums and resins)

DOBZYNSKI, Zbigniew; GRABOWSKI, Wacław; SOROKO, Jan

A case of contralateral pneumothorax following intracavitary administration of isoniazid in patients with mediastinal hernia. Gruzlica 23 no.12:889-891 Dec 55.

1. Z Państwowego Sanatorium Przeciwegrzelicznego w Tuszyńku.
Dyrektor: dr. M. Czekwianianc, i z Zakładu Medycyny Sadowej
A.M. w Łodzi. Kierownik: prof. dr. B. Puchowski, Sanatorium
Tuszynek k. Łodzi.

(TUBERCULOSIS, PULMONARY, compl.

mediastinal hernia, isoniazid ther. by intracavitary
admin. causing fatal contralateral pneumothorax)

(HERNIA

mediastinal, in pulm. tuberc., isoniazid ther. by
intracavitary admin., causing fatal contralateral
pneumothorax)

(NICOTINIC ACID ISOMERS, ther. use

isoniazid, in pulm. tuberc. with mediastinal hernia,
causing fatal contralateral pneumothorax by intracavitary
admin. of isoniazid.)

(PNEUMOTHORAX, ARTIFICIAL

contralateral, fatal, caused by intracavitary admin. of
isoniazid in ther. of pulm. tuberc. with mediastinal
hernia).

STEMPIEN, Ryszard; SOROKO, Jan; TOMASZEWSKA, Ludwika

Clostridium botulinum type E causing botulism. Pol. tyg. lek.
20 no.9:312-314 1 Mr'65.

1. Z Kliniki Chorob Zakaźnych Akademii Medycznej w Łodzi (kierownik: prof. dr. med. Jan Chrzanowski) i z Zakładu Medycyny Sądowej Akademii Medycznej w Łodzi (kierownik: prof. dr. med. Bronisław Puchowski).

SOROKO, K.B., inzh.

Automatic water dosimeter for batching plants. Bet. 1 shel.-bet.
no.2:85-86 F '61. (MIRA 14:2)

(Automatic control) (Mixing machinery—Equipment and supplies)

SOROKO, Lech, Tomaszow Mazowiecki

A case of surgical injury of the urinary tract. Przegl. lek.
Krakow 10 no.12:318-319 Dec 54.

1. Ze szpitala miejskiego w Tomaszowie Mazowieckim, dyrektor:
Dr. H.Glombik.

(URINARI TRACT, wounds and injuries
surg. inj.)

(WOUNDS AND INJURIES
urinary tract, surg. inj.)

Soroko, L.M.

USSR/ Nuclear Physics - Proton reactions

Card 1/1 Pub. 22 - 20/63

Authors : Meshcheryakov, M.G., member correspondent of the Acad. of Scs. of the USSR; Neganov, B.S.; Soroko, L.M.; and Vzorov, I.K.

Title : Anomalous change in the cross section of the elastic dispersion of protons by protons of 460-660 mev

Periodical : Dok. AN SSSR 99/6, 959-961, Dec 21, 1954

Abstract : Experiments with dispersions of protons of high energies were conducted in order to clarify the observed anomalous change in the cross section of an elastic dispersion of protons by protons of 460-660 Mev. A description of these experiments is presented. Eleven references; 3-USSR (1951-1954). Diagram.

Institution: Institute of Nuclear Problems of the Acad. of Scs. of the USSR

Submitted:

✓ 8205. REACTION $p + p \rightarrow \pi^0 + p + p$ IN THE REGION

539.18

400-600 MeV. L.M.Soroko.

Zh. éksp. teor. fiz., Vol. 30, No. 2, 296-303 (1956). In Russian.

*Nuc
Sci*

RML

Analysis similar to Rosenfeld's (Abstr. 11451/1954) shows that the $T = 3/2$, $J = 3/2$ nucleon isobar cannot take an overwhelming part in this process, especially since the nucleon cannot come off in an S-state relative to the isobar, but must have an angular momentum of at least one. Hence, one might expect a monotonic rise with energy of the cross-section. In this experiment a liquid hydrogen target is bombarded by protons slowed down by polythene blocks. Gamma-rays from the decay of π^0 -mesons are registered by a system of a telescope of three scintillation counters with a lead converter before the second counter, and a Cherenkov counter. Measurements of the cross-section at 90° in the region of $1 < \eta < 1.9$, where $\eta = p_m/\mu c$ and p_m = maximum meson momentum, μ = mass, show a monotonic rise with η . Assuming an isotropic distribution so as to get a total cross-section, the results are fitted by $\sigma_{pp} = C\eta^\alpha$ where $\alpha \approx 4$. (This dependence is much weaker than that predicted by Rosenfeld). A rough evaluation of the absolute value at full energy gave the cross-section at 90° for γ -rays as $(4.5 \pm 1.8) \times 10^{-28}$ cm²/sterad. Several results from other work published only in internal reports are given in tables and figures of this article.

G.E.Brown

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SOROKO, L.M.

CARD 1 / 2

PA - 1767

SUBJECT USSR / PHYSICS

AUTHOR SOROKO, L.M.

TITLE

The Elastic (p - p) Scattering and the Peculiarities of the
Interaction between a Pion and a Nucleon.
Zhurn.eksp.i teor.fis, 31, fasc.4, 699-701 (1956)
Issued: 1 / 1957

The strong interaction between a pion and a nucleon which exercises considerable influence upon the production process of the pion on the occasion of a collision with a nucleon may make itself felt also on the occasion of elastic (p - p) scattering. Of the two mechanisms which are possible in this case one of them is the following: $p + p \rightarrow (\pi + N + p)^* \rightarrow p' + p'$. This mechanism corresponds to resonance scattering. The second mechanism follows naturally from the known optical coupling between elastic and nonelastic processes. The elastic and the nonelastic cross section is of the same order because of this interaction, and the cross section of the nonelastic processes $N + N \rightarrow \pi + N + N'$ is comparatively large at energies of more than 400 MeV. The influence exercised by the second factor can therefore be considerable. The particular features of elastic (p - p) scattering are apparently characterized properly by the second mechanism. Elastic (p - p) scattering can be compared with the interaction processes between a pion and a nucleon if these processes are investigated in the case of equal values of the total energy in the center of mass system of the colliding particles. On this occasion also the energy which corresponds to the rest mass of the pion must be taken into

Žurn.eksp.i teor.fis, 31, fasc.4, 699-701 (1956) CARD 2 / 2

PA - 1767

account. The probability of scattering into a given angle is characterized by $k^2 d\sigma(\theta)/d\omega = \alpha(\theta)$. Here k denotes the wave vector of the colliding particles in the center of mass system, and $d\sigma/d\omega$ - the differential cross section of scattering into the angle θ in the center of mass system. Two diagrams illustrate the results of measurements of the differential cross sections of elastic ($p - p$) scattering into the angle 90° within the energy domain of from 160 MeV to 4,4 BeV, and the dependence of $\alpha(90^\circ)$ on the energy of the incident proton. The curve for $\alpha(90^\circ)$ has a maximum at the energy of 280 MeV (in the center of mass system). It is at these values of total energy that the known peculiarities of the process $p + p \rightarrow \pi^+ + d$ as well as the more simple processes $\bar{p} + p \rightarrow \pi^+ + p$ and $\pi^+ + p \rightarrow \pi^+ + p$ are investigated. The occurrence of this maximum is usually brought into connection with the peculiarities of interaction between a pion and a nucleon in the states with isotopic spin $T = 3/2$. Besides, another maximum for the states of the pion and the nucleon with isotopic spin $T = 1/2$ at an energy of ~ 600 MeV is known in the center of mass system. The curve which corresponds to the states of two nucleons with $T = 0$ must differ from the curve with $T = 1$. However, above an energy of (0,8 - 1,0) BeV the curves of the dependence of $\alpha(90^\circ)$ for the states of two nucleons with $T = 0$ and $T = 1$ are probably nearly equal to each other.

INSTITUTION:

SOROKO, L.M.

POSSIBLE EXPERIMENTS IN STUDYING THE PROCESSES
OF INELASTIC SCATTERING OF NUCLEONS. L. L. M.

Soroko, Joint Institute of Nuclear Research, Laboratory
of Nuclear Problems, May 1957. (In Russian)

Nucleon inelastic collisions $N + N \rightarrow \pi + N + N'$ at ~650
Mev were studied, and the angular correlation of the
mesons and nucleons based on the azimuthal asymmetry in
the emissions of these particles was determined. Similar
effects were investigated in the polarized nucleon beams.
Calculations were developed for the inelastic transitions
supposedly composing the total cross section of $N +$
 $N \rightarrow \pi + N + N'$ processes at 650 Mev. (tr-auth)

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1-EMP
1-L.M.

EMP

SOROKO, L.M.

9
ELASTIC (D-P) SCATTERING AND PECULIARITIES OF
INTERACTION BETWEEN PIONS AND NUCLEONS. L.M.

Soroko Soviet Phys. JETP 4, 879-80(1957) May.

The interaction between a pion and a nucleon may de-
pend on the process of elastic p-p scattering. It is con-
sidered that the peculiarities in this scattering are de-
pendent on the mechanism inevitably produced as a result of the
known optical relationship between elastic and inelastic
processes. (M.H.B.)

Envt
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1-2m2

SOROKO, L.M.

AUTHOR

SOROKO, L.M.

56-5-24/55

TITLE

The Resonance Interaction of a Pion With Nucleons, and the Production of Pions by Nucleons.

(Rezonansnoye vzaimodeystviye π -mezona s nuklonami i obrazovaniye π -mezonov nuklonami.- Russian)

PERIODICAL

Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 5, pp 1136-1142 (USSR)

ABSTRACT

The paper under review attempts to take into account by approximation the strong interaction of a pion with nucleons at the processes of production of a pion by nucleons. References is made to some relevant previously published papers. In addition to these computations, it is possible to compare phenomenologically these two processes, if we start out from the following assumption: The matrix element determining the probability of the process $N + N \rightarrow \pi + N + N'$ depends only on the energy of the pion with respect to one of the nucleons; the character of this energy dependence as well as the numerical values can be determined from the experimental data on the total cross sections of the interaction of a pion with a nucleon. The only necessary conditions for the occurrence of such a strong interaction reads as follows: In its initial state, the isotopic spin of the

CARD 1/2

56-5-24/55

The Resonance Interaction of a Pion With Nucleons, and
the Production of Pions by Nucleons

two nucleons must be $T = 1$. First of all, the matrix element of the interaction between pion and nucleon in the states with $T = 3/2$ is computed. Then the spectra of the pions and nucleons resulting from the process $N + N \rightarrow \pi + N' + N$ are computed and represented in diagrams. The curve of the mean value of the matrix element $H(p_\pi)$ intersects the axis of ordinates above the origin of coordinates. Incidentally, $H(p_\pi)$ has no maximum. But the nucleonic spectra have maxima at 280 to 300 MeV/c. The last chapter of the paper under review computes the angular correlation at the emission of a pion and of a nucleon. The H corresponding to the resonance is in good agreement with the experimental results, even better than $H = \text{const.}$ (7 reproductions)

ASSOCIATION: not given.
PRESENTED BY: -
SUBMITTED: 11.6. 1956
AVAILABLE: Library of Congress.

CARD 2/2

AKIMOV, Yu. K., SAVCHENKO, O. V. and SOROKO, L. M.

"Investigation of the Reaction $p + p \rightarrow d + \pi^+$ With Polarized Protons of High Energy"
Nuclear Physics, Vol. 8, No 6, November 1958, pp 637.

Joint Institute of Nuclear Research, Lab of Nuclear Problems.

Abstract: The angular dependence of the asymmetry in the emission of π^+ -mesons in the reaction $p + p \rightarrow \pi^+ + d$ was measured on a polarized proton beam at energies 536, 616 and 654 MeV. Direct proof of the existence of the d-state of the mesons in the reaction $p + p \rightarrow \pi^+ + d$ has been obtained. The results of the experiment are in agreement with the assumption that the amplitudes of the s- and d-transitions are considerable less than the amplitude of the transition $1D2 \rightarrow (3S1, p)2$. The limiting values of some partial cross sections have been estimated.

Soroko, L.M.

C-3

USSR/Nuclear Physics - Elementary Particles.

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 365

Author : Soroko, L.M.

Inst :

Title : Resonant Pion-Nucleon Interaction and Production of Pions
by Nucleons.

Orig Pub : Zg. eksperim. i teor. fiziki, 1957, 32, No 5, 1136-1142

Abstract : The experimental data on the scattering of pions by nucleons in the energy region from 30 to 400 Mev are analyzed by the author, who calculates the average matrix element of the pion-nucleon interaction. With the aid of this matrix element, the energy dependence of the total pion photoproduction cross section is calculated, along with the spectra of the mesons and nucleons that are formed during pion production in the nucleon-nucleon collision, and also the angular correlation in the emission of the pion and nucleon in the same process.

Card 1/2

USSR/Nuclear Physics - Elementary Particles.

C-3

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 365

Comparison is made with experimental data on the meson
production processes.

Card 2/2

SOROKO, L. M.

"Some Possible Experiments for the Investigation of Inelastic Scattering of Nucleons." Nuclear Physics, Vol. 7, No. 6, p. 573-578 1958.
(No. Holland Publ. Co.)

Abstract: Some possible experiments are considered which can be used to study inelastic collisions of nucleons of the type $N + N \rightarrow \pi + N + N'$. Processes of this type are most frequent in the 650 MeV energy region. Some non-trivial experiments on the meson-nucleon angular correlation are indicated which are based on the existence of azimuthal asymmetry in the emission of these two particles. Similar effects for a polarized nucleon beam are considered. The calculations are performed in terms of ten inelastic transition amplitudes, it being assumed that these transitions yield the main contribution to the total cross section of the $N + N \rightarrow \pi + N + N'$ process at 650 MeV.

Joint Inst. of Nuclear Research, Lab. of Nuclear Problems, Dubna, USSR

SOROKO, L. M.

56-114/56

AUTHOR: Soroko, L. M.

TITLE: Possible Experiments for Investigation of ~~Nonelastic~~ Scattering of Nucleons I (Vozmozhnyye opyty issledovaniyu protsessov neuprugogo rasseyaniya nuklonov. I.)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 1, pp. 87 - 96 (USSR)

ABSTRACT: The processes of inelastic collisions of nucleons investigated here take place according to the scheme $N + N \rightarrow T + N + N'$. They are the most intensive inelastic processes at energies of ~ 650 MeV. The purpose of the present work is to find out whether such reactions can be observed at all. At the beginning of this paper general remarks on this problem are made. In the case of the computations discussed here the formalism of the investigation of polarization effects on the occasion of inelastic collisions of electrons by Berestetskiy (reference 6) was used. First the initial function of two protons (the one of which contained in the target, is unpolarized) are writ-

Card 1/3

56-1-14/56

Possible Experiments for Investigation of ~~Non~~elastic Scattering of Nucleons.I.

ten down. Here the possibilities of different independent experiments are investigated only for the special case in which the limited number of amplitudes of inelastic transitions are taken into consideration. On the basis of this special computation some qualitative generalizations are then made. The amplitude of each transition is a function of the momentum of the pion and of the energy of the incident proton. The angular proportion and the proportion of momentum in the expressions for the cross sections are completely separated. Then the author computes the mean values of the spin tensors, which are in immediate connection with quantities which can be observed on the occasion of experiments. E. g. the mean value of the spin tensor of the zeroth degree $\langle T_{00} \rangle$ the differential cross section of the emission of a pion in the direction (θ, φ) , if the nucleons fly away into certain directions described here in detail. For the wave function in the terminal state an expression is also given. The results of the computations can be written down in the form $\langle T_{00} \rangle = \langle T_{00} \rangle_{\text{non-polarized}} + P \langle T_{00} \rangle_{\text{polarized}}$. In this connection P denotes the degree of polarization of the incident proton bundle.

Card 2/3

56-1-14/56

Possible Experiments for Investigation of ~~Non~~lastic Scattering of Nucleons.I.

For both terms of the just mentioned sum explicit expressions are given. As an example the reaction $p + p \rightarrow \pi^0 + p + p$ can be investigated to which only σ_{11} -transitions may contribute. In a supplement explicit expressions for the coefficients corresponding to the processes $p + p \rightarrow \pi^0 + n + p$ and $p + p \rightarrow \pi^+ + p + p$ are given. There are 2 figures, 1 table, and 8 references, 4 of which are Slavic.

ASSOCIATION: United Institute for Nuclear Research (Ob'yedinennyy institut yadernykh issledovaniy)

SUBMITTED: June 18, 1957

AVAILABLE: Library of Congress

Card 3/3

AUTHORS: Akimov, Yu. K., Savchenko, O. V., SOV/56-35-1-12/59
Soroiko, L. M.

TITLE: Investigation of the Reaction $p+p \rightarrow d+\pi^+$ in a Polarized Proton Beam (Issledovaniye reaktsii $p+p \rightarrow d+\pi^+$ na polarizovannom puchke protonov)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 1, pp 89 - 96 (USSR)

ABSTRACT: The authors first discuss various earlier papers dealing with the reaction $p+p \rightarrow d+\pi^+(1)$, as e.g. the investigation of (1) at $E_p = 460$ to 660 MeV (Ref 1), of $\pi^+d \rightarrow p+p$ at $E_{\pi^+} = 174 - 307$ MeV (Ref 2); investigation of (1) at $E_p = 314$ MeV with a polarized proton beam, observation of asymmetry as a result of interference between s- and p-state (Ref 3), analogous investigations at 415 MeV (Ref 4), π^+ -scattering on protons in the d-state (Refs 5,6) etc. The present paper contains a report on the investigation of the angular dependence of the asymmetry of the π^+ of (1), viz. for $E_p = 536, 616$ and 654 MeV; the primarily un-

Card 1/4

Investigation of the Reaction $p+p \rightarrow d+\pi^+$ in a
Polarized Proton Beam

SOV/56-35-1-12/59

polarized proton beam of 637 MeV was supplied by the synchro-cyclotron of the Ob'yedinennyy institut yadernykh issledovaniy (United Institute of Nuclear Research). The experimental arrangement is given in figure 1; the manner in which experiments are carried out is described. The polarized proton beam had the following intensities: 536 MeV : $0,9 \cdot 10^5$, 616 MeV: $5,5 \cdot 10^5$, 654 MeV: $2,8 \cdot 10^5$ protons /cm²sec. For the two first energies the graphite scatterer had 22,9 g/cm², and for 654 MeV 7,3 g/cm². The results obtained by measuring asymmetry are represented by figure 3. For the 3 E_p -values the following cross sections were obtained:

$$d\sigma/d\Omega \sim 0,24 + \cos^2\theta; \sim 0,22 + \cos^2\theta; \sim 0,27 + \cos^2\theta;$$

$$\sigma_{\text{total}} = 2,42 \cdot 10^{-27} \text{ cm}^2, 3,14 \cdot 10^{-27} \text{ cm}^2 \text{ and } 3,1 \cdot 10^{-27} \text{ cm}^2;$$

(θ is given in c.m.s.). The results obtained by these experiments prove the existence of a d-state of the π^+ from reaction (1) and agree with the assumption that the amplitudes of s- and d-transitions are considerably smaller than those of the ($^1D_2 \rightarrow ^2S_1$ p₂)-transition. For

Card 2/4

Investigation of the Reaction $p+p \rightarrow d+\pi^+$ in a
Polarized Proton Beam

SOV/56-35-1-12/59

the differential cross sections the following limiting
values were obtained:

$$\sigma(^1S_0 \rightarrow ^3S_1, p_0) \geq 10^{-3} \cdot \sigma_t(pp \rightarrow d\pi^+)$$

$$\sigma(s + d) \geq 5,4 \cdot 10^{-2} \cdot \sigma_t(pp \rightarrow d\pi^+)$$

$$\sigma(^1D_2 \rightarrow ^3S_1, p_2) \leq 0,945 \cdot \sigma_t(pp \rightarrow d\pi^+)$$

In conclusion, the authors thank M.G.Meshcheryakov, V.S. Neganov, and L.I.Lapidus for discussing the problem and N.P.Klepikov and S.N.Sokolov for working out experimental results. There are 5 figures, 3 tables, and 16 references, 10 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United
Institute of Nuclear Research)

Card 3/4

AUTHOR: Soroko, L. M.

SCV/56-35-1-38/59

TITLE: On the Scattering of a Proton by a Proton in the State 1D_2 at the Energy 616 MeV (O rasseyanii protona na protone v sostoyanii 1D_2 pri energii 616 MeV)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 35, Nr 1, pp. 276 - 277 (USSR)

ABSTRACT: The processes of pion production in (p-p) collisions complicate the character of the elastic scattering considerably. The correlation between the elastic and the inelastic collisions is investigated by means of the unitary S-matrix. If the proton energies are higher than ~ 600 MeV, the inelastic collisions which start from the 1D_2 state of both protons play the most important part. If only processes with the production of one pion are investigated (and if the d-state of the pion is neglected), the following processes may start from the state 1D_2 :

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On the Scattering of a Proton by a Proton in the
State 1D_2 at the Energy 616 MeV

SOV/56-35-1-38/59

1) an elastic (p-p) scattering; 2) the transition $^1D_2 \rightarrow (^3S_1p)_2$ in the reaction $p + p \rightarrow d + \pi^+$; 3) the transition $^1D_2 \rightarrow (^3S_1p)_2$ in the reaction $p + p \rightarrow n + p + \pi^+$; 4) the transition $^1D_2 \rightarrow (^3P_2s)_2$ in the reaction $p + p \rightarrow \pi^0 + p + p$. The fourth process may be neglected in the energy domain investigated. In this case the S matrix for the initial 1D_2 state ($T = 1; J = 2; \Pi = +$) may be given in the form

$$S = \begin{pmatrix} S_{11} & iS_{12} & iS_{13} \\ -iS_{12} & S_{22} & S_{23} \\ -iS_{13} & S_{23} & S_{33} \end{pmatrix}$$

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Index 1 denotes the (p-p) system, index 2 - the (π^+d) system, and index 3 - the (π^+np) system. Using the results of some

On the Scattering of a Proton by a Proton in the
State 1D_2 at the Energy 616 MeV

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previous papers the following values are obtained for the
energies $E_p = 654$ MeV:

$|S_{12}|^2 = 0,31$, $|S_{13}|^2 = 0,41$ and $|S_{11}|^2 = 0,28$. A diagram
shows the results for the energy interval from $E_p = 400$
to $E_p = 800$ MeV. All the 3 curves have the tendency to
intersect at a point that corresponds to the proton energy
 $E_p = 616$ MeV. For this value the total energy in the system
connected with the center of inertia of the two colliding
protons is equal to the resonance energy of meson nucleon
scattering when the rest mass of the pion is taken into
account. If all these assumptions are true, there are 2
additional unitarity conditions

$|S_{22}|^2 = |S_{33}|^2$; $|S_{22}|^2 + |S_{23}|^2 = 2/3$. These results may be
used for the phase analysis of the (p - p) scattering and of
the scattering of a positive pion by a deuteron. The author

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On the Scattering of a Proton by a Proton in the
State $1D_2$ at the Energy 616 MeV

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thanks R.M.Ryndin for his useful advice. There are 4 references,
3 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United In-
stitute of Nuclear Research)

SUBMITTED: March 28, 1958

Card 4/4

SOROKO, L. M., Candidate Phys-Math Sci (diss) -- "Investigation of the polarization effects in the reaction $p^+ p \rightarrow \alpha^+ \pi^+$ with proton energies of 530-670 MEV". Dubna, 1959. 15 pp (Joint Inst of Nuclear Investigations, Lab of Nuclear Problems), 170 copies (KL, No 22, 1959, 108)

21(7)

AUTHORS:

Akimov, Yu. K., Marish, K. S.,
Savchenko, O. V., Soroko, L. M.

SOV/56-37-1-8/64

TITLE:

Measurement of Deuteron Polarization in the Reaction
 $p + p \rightarrow d + \pi^+$ at a Proton Energy of 670 Mev (Izmereniye polya-
rizatsii deytronov v reaktsii $p + p \rightarrow d + \pi^+$ pri energii proto-
nov 670 MeV)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 37, Nr 1, pp 46-53 (USSR)

ABSTRACT:

The authors give a report about results obtained by measure-
ments of the vector polarization of deuterons originating from
the reaction $p + p \rightarrow d + \pi^+$ carried out at angles of 121° ,
 $140^\circ 30'$, and 162° in the cms. In the introduction some theoret-
ical discussions, basing upon the approximation method by
Tripp (Ref 1) are given. The experimental device is shown by
figure 1 and is, like the measuring apparatus (block scheme)
(Fig 2) discussed in the following. The proton beam used had
an average energy of 670 Mev and an intensity of $5 \cdot 10^{10}$ /sec-
onds. Figures 3 and 4 show the measuring results; figure 3:
 $i \langle T_{11} \rangle_{d\pi^+}$ figure 4: $N(\theta_d^*)$. Measurements of the vector
polarization of deuterons, and the data on the angular

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Measurement of Deuteron Polarization in the Reaction $p + p \rightarrow d + \pi^+$ at a Proton Energy of 670 Mev SOV/56-37-1-8/64

distribution of the reaction in the case of a non-polarized proton beam make it possible to determine the amplitude of the nonresonance p-transition $^1S_0 \rightarrow ^3S_1 p_0$. The contribution of this transition to the total reaction cross section is about 1 %, exactly: $(1.0^{+0.6}_{-0.45}) \cdot 10^{-2} \sigma_{\text{tot}}$. The transition amplitude $^1S_0 \rightarrow ^3S_1 p_0$ grows somewhat (~ 1.7) if E_p increases from 340 to 670 Mev, but its complex phase varies with respect to the amplitude of the transition $^1D_2 \rightarrow ^3S_1 p_2$ by 20° . The measured angular dependence of the deuteron vector polarization is not in contradiction to the assumption that the amplitudes of the transitions $^3F_2 \rightarrow ^3S_1 d_2$ and $^3F_3 \rightarrow ^3S_1 d_3$ are equal to zero. The authors finally thank V. I. Komarov for his assistance in carrying out measurements, and L. I. Lapidus, M. G. Meshcheryakov, and R. M. Ryndin for discussions. There are 5 figures and 15 references, 8 of which are Soviet.

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Measurement of Deuteron Polarization in the Reaction SOV/56-37-1-8/64
 $p + p \rightarrow d + \pi^+$ at a Proton Energy of 670 Mev

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute
of Nuclear Research)

SUBMITTED: February 17, 1959

Card 3/3

SOROKO, L.M., MARISH, K.S.,

"On the Complete Set of Experiments on the Determination of the Amplitude Ratios of Pion Production in Nucleon Collision with Different Isotopic Spin States"

paper presented at the International Conference on High Energy Physics, Rochester, N.Y. and/or Berkly California, 25 Aug - 16 Sep 1960.

AKIMOV, Yu.K.; KOMAROV, V.I.; SAVCHENKO, O.V.; SOROKO, L.M.

Separation of particles according to the ionization value in
some scintillation counters. Prib.i tekhn.eksp. no.4:71-77
J1-Ag '60. (MIRA 13:8)

1. Ob'yedinennyy institut yadernykh issledovaniy.
(Scintillation counters)

AKIMOV, I.K.; MARISH, C.S.; SAVCHENKO, O.V.; SOROKO, L.M.

Measurement of the deuteron polarization in the $p+p \rightarrow d \pi^+$ reaction
in the proton energy of 670 MeV. Studii cerc fiz ll no.3:489-500
'60. (EEAI 10:2)

(Deuterons) (Protons) (Polarization)
(Nuclear reactions)

AKIMOV, Yu.K.; SAVCHENKO, O.V.; SOROKO, L.M.

$d + d \rightarrow \pi^0 + He_4$ Reaction at a deuteron energy of 400 Mev. Zhur.
eksp. i teor. fiz. 38 no.1:304-306 Jan '60. (MIRA 14:9)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Nuclear reactions)

Soroko, L. M.

82031
S/056/60/038/02/48/061
B006/B014

24.6600

AUTHORS: Akimov, Yu. K., Savchenko, O. V., Soroko, L. M.

TITLE: The Reaction $p + d \rightarrow t + \pi^+$ at a Proton Energy of 670 Mev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 2, pp. 643-644

TEXT: The cross sections of the reactions $p + d \rightarrow t + \pi^+$ (1) and $p + d \rightarrow \text{He}^3 + \pi^0$ (2) have been compared earlier, and a ratio of 2:1 has been obtained. The cross sections were measured at 340, 450, and 600 Mev (Refs. 1-6). In the present "Letter to the Editor" the writers report on a comparison of these two reaction modes at $E_p = 670$ Mev. The proton beam used had an intensity of 10^{11} protons/sec. The secondaries produced in targets of heavy polyethylene and carbon were identified with regard to momentum, specific ionization, and range. The yield of low-energy tritium nuclei was measured in the laboratory system under the angles 5.4° and 11° . The absolute cross sections were calibrated according to the deuteron yield of the reaction $p + p \rightarrow d + \pi^+$ whose angular

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S/056/61/040/002/032/047
B102/B201

AUTHORS: Marish, K. S., Soroko, L. M.

TITLE: A complete set of experiments for determining the relations between the amplitudes of pion production by nucleons with various isotopic spins

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 2, 1961, 605-612

TEXT: A number of experiments is required to be conducted under different conditions for setting up a complete phenomenological theory of pion production by nucleons. The problem consists in that the complete system of required experiments be determined. Studies of this kind have been repeatedly made, but divergences between theory and experiments have always resulted at high energies (400-600 Mev). This concerns particularly S. Mandelstam (Proc. Roy. Soc., A224, 491, 1958), who has tried to extend the phenomenological theory to the high-energy range, and who worked out a resonance theory; the most recent experiments on pion production in np interactions showed that the predictions of the

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B102/B201

resonance theory give no agreement with experiments. To check the usability of Mandelstam's resonance model it is first necessary to decide whether the πN interaction should be taken into account only for the isotopic spin $T = 3/2$, or also for $T = 1/2$. It is a known fact that experiments conducted so far are not sufficient to obtain the amplitude relations for a complete theory. The authors of the present paper wanted to determine the complete system of the required experiments for checking the resonance model by Mandelstam. The phenomenological description of the pion production processes in the isotopic spin space requires the introduction of three independent amplitudes; the probability of a pion production in any nucleon-nucleon interaction can be expressed by these three amplitudes. It is found, when taking account of the charge symmetry, that there are seven different NN-interaction processes in which pions are produced; their differential cross sections are given by:

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$$I. d\sigma(pp \rightarrow np\pi^+) = \frac{1}{2}|F_{10}|^2 + \frac{1}{4}|F_{11}|^2 + \sqrt{1/2}|F_{11}||F_{10}|\cos\Phi_{10,11} = \frac{3}{4}|A_{13}|^2,$$

$$II. d\sigma(pp \rightarrow pn\pi^+) = \frac{1}{2}|F_{10}|^2 + \frac{1}{4}|F_{11}|^2 - \sqrt{1/2}|F_{11}||F_{10}|\cos\Phi_{10,11} = \\ = \frac{1}{3}\left[\frac{1}{4}|A_{13}|^2 + 2|A_{11}|^2 - \sqrt{2}|A_{13}||A_{11}|\cos\Phi_{13}\right],$$

$$III. d\sigma(pp \rightarrow pp\pi^0) = \frac{1}{2}|F_{11}|^2 = \frac{1}{3}\left[\frac{1}{2}|A_{13}|^2 + |A_{11}|^2 + \sqrt{2}|A_{13}||A_{11}|\cos\Phi_{13}\right],$$

$$IV. d\sigma(pn \rightarrow nn\pi^+) = \frac{1}{6}|F_{01}|^2 + \frac{1}{4}|F_{11}|^2 - \sqrt{1/6}|F_{01}||F_{11}|\cos\Phi_{01,11} =$$

$$= \frac{1}{6}\left[\frac{1}{2}|A_{13}|^2 + |A_{11}|^2 + |A_{01}|^2 + \sqrt{2}|A_{13}||A_{11}|\cos\Phi_{13} - \right. \\ \left. - 2|A_{11}||A_{01}|\cos\Phi_{01} - \sqrt{2}|A_{13}||A_{01}|\cos\Phi_{03}\right], \quad (1)$$

$$V. d\sigma(np \rightarrow nn\pi^+) = \frac{1}{6}|F_{01}|^2 + \frac{1}{4}|F_{11}|^2 + \sqrt{1/6}|F_{01}||F_{11}|\cos\Phi_{01,11} = \quad (1)$$

$$= \frac{1}{6}\left[\frac{1}{2}|A_{13}|^2 + |A_{11}|^2 + |A_{01}|^2 + \sqrt{2}|A_{13}||A_{11}|\cos\Phi_{13} + \right. \\ \left. + 2|A_{11}||A_{01}|\cos\Phi_{01} + \sqrt{2}|A_{13}||A_{01}|\cos\Phi_{03}\right],$$

$$VI. d\sigma(np \rightarrow np\pi^0) = \frac{1}{12}|F_{01}|^2 + \frac{1}{4}|F_{10}|^2 - 2\sqrt{1/3}|F_{01}||F_{10}|\cos\Phi_{01,10} =$$

$$= \frac{1}{6}\left[|A_{13}|^2 + \frac{1}{2}|A_{11}|^2 + \frac{1}{2}|A_{01}|^2 - \sqrt{2}|A_{13}||A_{11}|\cos\Phi_{13} - \right. \\ \left. - \sqrt{2}|A_{13}||A_{01}|\cos\Phi_{03} + |A_{11}||A_{01}|\cos\Phi_{01}\right],$$

$$VII. d\sigma(np \rightarrow pn\pi^0) = \frac{1}{12}|F_{01}|^2 + \frac{1}{4}|F_{10}|^2 + 2\sqrt{1/3}|F_{01}||F_{10}|\cos\Phi_{01,10} =$$

$$= \frac{1}{6}\left[|A_{13}|^2 + \frac{1}{2}|A_{11}|^2 + \frac{1}{2}|A_{01}|^2 + \sqrt{2}|A_{13}||A_{11}|\cos\Phi_{13} + \right. \\ \left. + \sqrt{2}|A_{13}||A_{01}|\cos\Phi_{03} - |A_{11}||A_{01}|\cos\Phi_{01}\right].$$

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Here, F_{ij} are the three amplitudes if in the end state the subsystem consists of two nucleons (i - isotopic spin of the two nucleons in the initial state, j - in the end state), and A_{il} are the amplitudes if the final subsystem consists of pion and nucleon ($l = 2 T_{\pi N}, T_{\pi N}$ - isotopic spin of the πN subsystem). The processes I and II, IV and V and VI and VII differ by the interference between two amplitudes. Methods of establishing these differences experimentally are discussed. A comparison between the reactions $pn \rightarrow nn\pi^+$ and $pn \rightarrow pp\pi^-$ at equal pion emission angles will be sufficient for the difference between IV and V. For I and II as well as VI and VII the differential cross sections in

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the processes $pp \rightarrow pn\pi^+$ and $pp \rightarrow np\pi^+$ must be measured in the angular ranges $0 < \theta_\pi < \pi/2$ and $0 < \theta_{12} < \pi/2$. The differences of the total cross sections for I and II are given by

$$\Delta\sigma_{10,11} = 4 \int_0^{\pi/2} \int_0^{\pi/2} [d\sigma_{pn\pi^+}^{pp}(\theta_\pi, \theta_{12}) - d\sigma_{pn\pi^+}^{pp}(\theta_\pi, \theta_{12})] d\Omega(\theta_\pi) d\Omega(\theta_{12}), \quad (4), \quad (4),$$

for VI and VII by

$$\Delta\sigma_{01,10} = 4 \int_0^{\pi/2} \int_0^{\pi/2} [d\sigma_{np\pi^+}^{pp}(\theta_\pi, \theta_{12}) - d\sigma_{np\pi^+}^{pp}(\theta_\pi, \theta_{12})] d\Omega(\theta_\pi) d\Omega(\theta_{12}). \quad (5), \quad (5),$$

and for IV and V by

$$\begin{aligned} \Delta\sigma_{01,11} &= 2 \int_0^{\pi/2} [d\sigma_{nn\pi^+}^{pp}(\theta_\pi) - d\sigma_{nn\pi^+}^{pp}(\theta_\pi)] d\Omega(\theta_\pi) = \\ &= 2 \int_0^{\pi/2} [d\sigma_{pp\pi^-}^{pp}(\theta_\pi) - d\sigma_{nn\pi^+}^{pp}(\theta_\pi)] d\Omega(\theta_\pi). \end{aligned} \quad (6), \quad (6).$$

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The amplitudes F_{ij} can be obtained with

$$\begin{aligned} \sigma(pp \rightarrow \pi^+) &= |F_{10}|^2 + \frac{1}{2}|F_{11}|^2, & \sigma(np \rightarrow \pi^0) &= \frac{1}{6}|F_{01}|^2 + \frac{1}{2}|F_{10}|^2, \\ \sigma(pp \rightarrow \pi^0) &= \frac{1}{2}|F_{11}|^2, & \sigma(np \rightarrow \pi^+) &= \frac{1}{3}|F_{01}|^2 + \frac{1}{2}|F_{11}|^2. \end{aligned} \quad (7)$$

$$\Delta\sigma_{10,11} = \sqrt{2} \Omega_{10,11}, \quad \Delta\sigma_{01,11} = \sqrt{2/3} \Omega_{01,11}, \quad \Delta\sigma_{01,10} = \sqrt{1/3} \Omega_{01,10},$$

где

$$\Omega_{ij,kl} = |F_{ij}| |F_{kl}| \cos \Phi_{ij,kl}.$$

from the experimentally observed quantities with the aid of relations

$$\begin{aligned} |F_{10}|^2 &= \sigma(pp \rightarrow \pi^+) - \sigma(pp \rightarrow \pi^0), & \Omega_{10,11} &= \sqrt{1/2} \Delta\sigma_{10,11}, \\ |F_{11}|^2 &= 2\sigma(pp \rightarrow \pi^0), & \Omega_{11,01} &= \sqrt{3/2} \Delta\sigma_{11,01}, \end{aligned} \quad (8)$$

$$|F_{01}|^2 = 3[\sigma(np \rightarrow \pi^+) + \sigma(np \rightarrow \pi^-) - \sigma(pp \rightarrow \pi^0)], \quad \Omega_{10,11} = \sqrt{3} \Delta\sigma_{10,01}.$$

Once the F_{ij} have been determined, the A_{ij} can be determined as well with

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$$\begin{aligned} A_{13} &= \sqrt{\frac{2}{3}} F_{10} + \sqrt{\frac{1}{3}} F_{11}, & A_{13}^2 &= \frac{2}{3} F_{10}^2 + \frac{1}{3} F_{11}^2 + \frac{2}{3} \sqrt{2} \Omega_{10,11} \\ A_{11} &= -\frac{1}{3} F_{10} + \sqrt{\frac{2}{3}} F_{11}, & A_{11}^2 &= \frac{1}{9} F_{10}^2 + \frac{2}{9} F_{11}^2 - \frac{2}{3} \sqrt{2} \Omega_{10,11} \\ A_{01} &= F_{01}, & A_{01}^2 &= F_{01}^2; \\ \omega_{13} &= \frac{1}{3} \sqrt{2} F_{11}^2 - \frac{1}{3} \sqrt{2} F_{10}^2 + \frac{1}{3} \Omega_{10,11}, \\ \omega_{01} &= -\sqrt{\frac{1}{3}} \Omega_{10,01} + \sqrt{\frac{2}{3}} \Omega_{11,01}, & \omega_{03} &= \sqrt{\frac{2}{3}} \Omega_{10,01} + \sqrt{\frac{1}{3}} \Omega_{11,01} \end{aligned} \quad (9)$$

or explicitly by the observation quantities

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$$\begin{aligned}
 |A_{13}|^2 &= \frac{2}{3} \sigma(pp \rightarrow \pi^+) + \frac{2}{3} \Delta\sigma_{10,11}, \\
 |A_{11}|^2 &= \sigma(pp \rightarrow \pi^0) + \frac{1}{3} \sigma(pp \rightarrow \pi^+) - \frac{2}{3} \Delta\sigma_{10,11}, \\
 |A_{01}|^2 &= 3[\sigma(np \rightarrow \pi^+) + \sigma(np \rightarrow \pi^-) - \sigma(pp \rightarrow \pi^0)], \\
 \omega_{13} &= \frac{1}{3} \sqrt{2} [3\sigma(pp \rightarrow \pi^0) - \sigma(pp \rightarrow \pi^+)] + \frac{1}{3} \sqrt{1/2} \Delta\sigma_{10,11}, \\
 \omega_{01} &= \Delta\sigma_{11,01} - \Delta\sigma_{10,01}, \quad \omega_{03} = \sqrt{2} \Delta\sigma_{10,01} + \sqrt{1/2} \Delta\sigma_{11,01}, \\
 \omega_{11} &= |A_{11}| |A_{13}| \cos \varphi_{11}.
 \end{aligned}
 \tag{10}$$

A study of the reactions $np \rightarrow pp\pi^-$ and $np \rightarrow nn\pi^+$ with 600-Mev neutrons has shown that $|F_{01}| \neq 0$ and that $\Delta\sigma_{01,11}$ in this energy range is almost vanishing. From $\sigma(pp \rightarrow \pi^+)$ and $\sigma(pp \rightarrow \pi^0)$ measurements with 600-Mev protons one obtains $|F_{10}|$ and $|F_{11}|$. It was found to be necessary and sufficient to measure $\Delta\sigma_{01,11}$ for checking the resonance theory of pion production by nucleon interaction; this difference is a function

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of the asymmetry in the proton- and neutron emission with respect to the angle of departure of the π^+ meson. L. I. Lapidus is thanked for his interest and for discussions. There are 2 figures and 13 references: 7 Soviet-bloc and 6 non-Soviet-bloc.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint
Institute of Nuclear Research)

SUBMITTED: August 16, 1960

Card 9/9

AKIMOV, Yu.K.; SAVCHENKO, O.V.; SOROKO, L.M.

Search for anomalies in the energy dependence of the cross section of the reaction $p + p \rightarrow d + \pi^+$ in the threshold region of the formation of π -meson pairs. Zhur. eksp. i teor. Fiz. 40 no.5:1530-1532 My '61. (MIRA 14:7)

1. Ob'yedinennyy institut yadernykh issledovaniy.
(Nuclear reactions) (Protons) (Mesons)

AKEROV, Yu.K.; KOMAROV, V.I.; MARISH, K.S.; SAVCHENKO, O.V.; SOROKO, L.M.

Search for anomalies in the spectrum of H^3 nuclei emitted
in the reaction $p + p \rightarrow H^3 + \pi^+ + p$ at a proton energy
of 670 Mev. Zhur. eksp. i teor. fiz. 40 no.5:1532-1535 My
'61. (MIRA 14:7)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Nuclear reactions) (Mesons) (Protons)

28752

S/056/61/041/003/005/020
B125/B102

24.6600

AUTHORS: Akimov, Yu. K., Savchenko, O. V., Soroko, L. M.

TITLE: Experimental verification of the principle of charge
invariance in the reaction $d + d \rightarrow \text{He}^4 + \pi^0$ at a deuteron
energy of 400 Mev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41,
no. 3(9), 1961, 708-724

TEXT: The reaction $d + d \rightarrow \text{He}^4 + \pi^0$ (11), which is forbidden according to
the law of invariance of the total isotopic spin, has been studied on a
400-Mev deuteron beam. L. I. Lapidus (ZhETF, 31, 865, 1956) suggested
this reaction for verifying the charge invariance. This reaction is only
associated with one charge state of particles so that the perturbation
due to the difference between neighboring charge states is automatically
excluded. This reaction has already been dealt with in the proceedings
of the Kiev and Rochester Conferences on High-energy Physics in 1959 and
1960. This article presents new results on the reaction (11) and on the

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Experimental verification of the...

cross sections of the reactions $d + d \rightarrow He^4 + \gamma$ ($E_d = 400$ Mev) (12) and $p + He^3 \rightarrow He^4 + \pi^+$ (13) at $E_d = 670$ Mev. The authors restrict themselves to a class of phenomena, for which the principle of charge invariance leads to the production of pions by nucleons and light nuclei. A two-section magnetic quadrupole lens with an aperture of 80 mm focused the deuteron or proton beam to the target. The secondary charged particles produced in the target were sorted out by a brass collimator, were magnetically deflected, passed through a steel collimator, and were finally recorded in the concrete shield by scintillation counters. The deuteron beam emerging from the synchrocyclotron had an average energy of 405.3 ± 0.5 Mev. The charged particles were sorted out according to their effective momentum, their specific ionization, their range, and their time of flight. They were recorded by scintillators, a six-counter telescope, etc. A. N. Gorbunov and V. N. Spirodonov analyzed the energy dependence of the electric quadrupole transition in the reaction $\gamma + He^4 \rightarrow H^3 + p$.

Conclusions: 1) The total cross section of the reaction $d + d \rightarrow He^4 + \pi^0$ at $E_{\pi^0} \sim 80$ Mev in the center-of-mass system does not exceed the cross section

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of the electromagnetic process $d + d \rightarrow \text{He}^4 + \gamma$, whereas the expected ratio between the cross sections of these processes must be about 10^2 if they are not forbidden. 2) The total cross section of the reaction

$p + \text{He}^3 \rightarrow \text{He}^4 + \pi^+$ at the same pion energy in the center-of-mass system is $7 \cdot 10^3$ times greater than the upper limit of the cross section of the

reaction $d + d \rightarrow \text{He}^4 + \pi^0$. This difference cannot be explained only by the structure of the colliding nuclei. 3) The upper limit of the total cross

section of the reaction $d + d \rightarrow \text{He}^4 + \pi^0$ amounts to $\sim 3\%$ of the cross section calculated for the "allowed" process. 4) All the facts discussed here are indicative of a rigorous forbiddenness in the reaction

$d + d \rightarrow \text{He}^4 + \pi^0$, and, thus, confirms the law of invariance of the total isotopic spin in the production of pions by nucleons and light nuclei.

5) There exists no isotopically scalar π_0^0 meson with a rest mass of 100-150 Mev. The authors thank L. I. Lapidus for discussing the experimental program, V. P. Dzhelepov for interest and assistance, R. M. Sulyayev and B. S. Neganov for assistance in experiments with

Card 3/4

Experimental verification of the...

28752
S/056/61/041/003/005/020
B125/B102

gaseous He³, and also Kim Ze Pkhe and I. V. Puzynin, co-workers of the OIYaI computer center, for computations. There are 11 figures, 1 table, and 26 references: 12 Soviet and 13 non-Soviet. The three most recent references to English-language publications read as follows:

H. S. Köhler, Phys. Rev., 118, 1345, 1960; A. V. Creve, B. Ledley, E. Lillethan, S. M. Marcowitz, C. Rey. Phys. Rev., 118, 1091, 1960; D. Harting, J. C. Kluyver, A. Kusumegi, R. Rigopoulos, A. M. Sacks, G. Tibell, G. Vanderhaeghe, G. Weber. Phys. Rev., 119, 1716, 1960. X

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: April 21, 1961

Card 4/4

SOROKO, L.M.

AKIMOV, Yu. K., SAVCHENKO, O. V. and SOROKO, L. M.

"Search for Anomalies in the Energy Dependence of the Cross Section
of the $p + p \rightarrow d + \pi^+$ Reaction Near the Threshold of Two Pion Production^{x)}

report presented at the Intl. Conference on High Energy Physics, Geneva,
4-11 July 1962

Joint Inst. for Nuclear Research
Lab. of Nuclear Problems

SOROKO

AKIMOV, Yu. K., KOMAROV, V. I., KEMARISH, SAVCHENKO, O. V., SOROKO, L. M.

"~~γγ~~-Anomalies of the H^3 -Spectrum in the Reaction $p + d \rightarrow H^3 + \gamma + \pi^+$
at the Proton Energy of 670 MeV^x)"

report presented at the Intl. Conference on High Energy Physics, Geneva,
4-11. July 1962.

Lab. of Nuclear Problems, *Joint Inst. Nuclear Research*

SOROKO, L. M.

AKIMOV, Yu. K., SAVCHENKO, O. V., SOROKO, L. M.

"Experimental Verification of the Charge Invariance Principle in the
 $d + d \rightarrow \pi^0 + He^4$ Reaction for 400 Mev Deuterons"

report presented at the Intl. Conference on High Energy Physics, Geneva,
4-11 July 1962

Joint Institute for Nuclear Research
Laboratory of Nuclear Problems

5/089/62/012/005/009/014
B102/B104

24.6000
AUTHORS:

Akimov, Yu. K., Butslov, M. M., Savchenko, O. V.,
Soroko, L. M.

TITLE:

Controllable luminescence chamber with a scintillator of a
working volume of 2500 cm³

PERIODICAL: Atomnaya energiya, v. 12, no. 5, 1962, 413-415

TEXT: An apparatus working with a controllable scintillation chamber (Fig. 1) which can be used to photograph charged cosmic particles is described. The scintillator measures 130-150-150 mm and is composed of 20,000 filaments, packed in layers as ABAB.. with A↑B. The layers are separated by black paper sheets to absorb scattered light. The filaments, ~1 mm in diameter, are made of a polymer on basis of polystyrene + 1% tetraphenyl butadiene or 2% terphenyl and 0.02% ROROR.

Since the de-excitation times are $(3-5) \cdot 10^{-9}$ sec and the delay times in the control circuits are less than 0.1 μsec, the chamber can be controlled by an image memory with a very short storage time.. The image from any
Card 1/3

Controllable luminescence chamber with ... S/059/62/012/005/009/014
B102/B104

element is stored in the single chamber electron-optical converter (EOP) which contains a luminophor of constant de-excitation time ($\sim 0.7 \mu\text{sec}$) for the fast component; its conversion efficiency is 10% of that of ZnS(Ag) . The control system consists of three scintillation counters connected in coincidence; the passage of a charged particle through the coincidence pulse starts two control schemes. In the first a square pulse of 1 μsec duration is formed; this opens the electron-optical shutter; in the second, a square pulse of negative polarity is formed; this is retarded by 25 μsec to reach maximum brightness. The track projection of a particle passing through the scintillator is thus obtained as a sequence of light spots (for a photoelectron about 10, which is the seventh part of the number of filament layers joined with the photocathode). The apparatus is suitable, e. g., for investigating such reactions as $\pi^+ \rightarrow \pi^0 + e^+ + \mu^+$ or $\mu \rightarrow e + \nu$. There are 3 figures.

SUBMITTED: July 22, 1961

Fig. 1. Complete diagram of apparatus with luminescence chamber.
Legend: (1) Scintillation counters, (2) scintillator of the chamber,
Card 2/3

Controllable luminescence chamber with ...

S/089/62/012/005/009/014
B102/B104

(3) coincidence circuit, (4) block for control pulse delay, (5) pulse generator, (6) high-voltage pulse generator, (7) EOP, (8) objective, (9) deflecting plate of electron-optical shutter, (10), multi-stage EOP, (11) coil, (12) photographic apparatus.

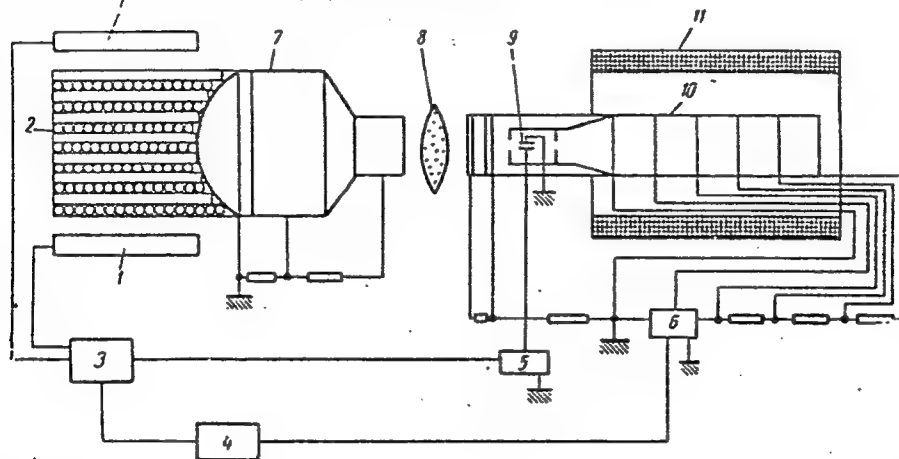


FIG. 1

Card 3/3

APR 1988 000(m)/T/000(m)-2 AFRL/CCO/ASD(a)-5/000(a)/000(a)
 00000000 NR: AP4047888 S/0000/00/007/004/1220/1201

ADJUDGS: Guzhavin, V. M.; Kliger, G. K.; Kolganov, V. Z.; Lebedev, A. V.; Marich, K. S.; Musin, M. A.; Prokoshkin, Yu. D.; Smolyankin, V. T.; Sokolov, A. P.; Soroko, L. M.; Ts'ui, Wa-ch'uang

TOPIC: Elastic proton scattering at 650 MeV

ИСТОЧНИК: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47,
no. 4, 1964, 1228-1231

TOPIC TAGS: proton proton scattering, elastic scattering, angular dependence, scattering cross section, differential cross section

ABSTRACT: A total of 1767 events of elastic p-p scattering at 650 MeV was registered with the liquid-bubble chamber of the ITEP, placed in the beam of protons with energy 650 ± 5 MeV. The equipment and procedure were described by the authors elsewhere (ZhETF v. 46, 1245, 1964); the proton scattering angles were measured with

Card 1/2

L 13945-85

ACCESSION NR: AP4047888

3

the LYaP reprojector (A. T. Vasilenko et al. PTE, No. 6, 34, 1957).
A statistical comparison of the present data with earlier results
is made. The angular dependence of the differential cross section,
averaged over angle intervals of 3° , is deduced from the results and
approximated by means of an empirical polynomial. "In conclusion we
thank M. P. Baldin for help with the measurements on the reprojector
and microscope, and L. I. Lapidus for a discussion of the results."
Orig. art. has: 2 figures, 2 formulas, and 1 table.

ASSOCIATION: Ob"yedinenny*y institut yaderny*kh issledovaniy
(Joint Institute of Nuclear Research)

SUBMITTED: 30Apr64

ENCL: 00

SUB CODE: NP

NR REF SOV: 006

OTHER: 001

Cord 2/2

GUTHAVIN, V.M.; KLIGER, G.K.; KOLGANOV, T.Z.; LEBEDEV, A.T.; MORISE, I.S.;
MUSIN, M.A.; PROKOSHKIN, Yu.D.; SMOLYANIN, V.I.; SOROKET, A.F.;
SOROKO, L.M.; TSUY VA-CHUAN [Ts'ui Wa-ch'uang]

Elastic scattering of 650 Mev. protons. Zhur. eksp. i teor. fiz.
47 no.4:1228-1231 0 '64. (MIRA 18:1)

1. Ob'yedinennyy institut yadernykh issledovaniy.

L 65054-65 EWT(m)/EPA(m)=2/EWA(m)=2 IJP(c)

ACCESSION NR: AT5009472

Z/0000/64/000/000/0254/0258

AUTHORS: Pliss, Yu. A. ^{W.S.} Soroko, L. M. ^{W.S.}

TITLE: Proton depolarization in cyclotrons ^{19 W.S.}

SOURCE: Conference on Low Temperature Physics and Techniques, 3d, Prague, 1963. Physics and techniques of low temperatures; proceedings of the conference. Prague, Publ. House of the Czechosl. Academy of Sciences, 1964, 254-258

TOPIC TAGS: proton accelerator, proton polarization, deuteron reaction, depolarization, relativistic particle, synchrocyclotron

ABSTRACT: The authors first describe briefly a method of calculating the depolarization of resonance produced in a particle accelerator, based on linearization of the relativistic equation of spin motion in an external electromagnetic field, and then presents the results of depolarization calculations for protons investigated in

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L 65054-65

ACCESSION NR: AT5009472

3

the synchrocyclotron of the Laboratory of Nuclear Problems of the Joint Institute of Nuclear Research in Dubna. An analysis shows that phase oscillations do not change the result of the calculation. The calculations of proton depolarization in a relativistic cyclotron were made on the basis of the design topography of the magnetic field, and were aimed at determining the requirements of shimming accuracy of the magnetic field. It is shown that the requirements for a relativistic cyclotron are somewhat more stringent than those for a synchrocyclotron because of the stronger radial and azimuthal variations of the magnetic field. It is reported that the depolarizing effects in the cyclotron with the azimuthal variation of the magnetic field of the I. V. Kurchatov Atomic Energy Institute have been calculated by this method and despite strong field modulation in this cyclotron, nonresonance depolarization is very small, while the resonance depolarization does not occur. "The authors thank V. P. Dmitriyevskiy and V. V. Kolga for valuable remarks." Orig. art. has: 2 tables and 13 formulas.

Card 2/3

L 65054-65

ACCESSION NR: AT5009472

3

ASSOCIATION: Laboratory of Nuclear Problems, Joint Institute of
Nuclear Research, Dubna

4/55

SUBMITTED: 000064

ENCL: 00

SUB CODE: NP

NR REF SOV: 003

OTHER: 001

MLR

Card 3/3

BARDIN, I.P.; BORISOV, A.F.; BELAN, R.V.; YERMOLAYEV, G.I.; VAYSBERG, L.E.;
ZHEREBIN, B.N.; BORODULIN, A.I.; SHAROV, G.V.; DOMNITSKIY, I.F.; CHUSOV, F.P.
SOROKO, L.E.; KLIMASENKO, L.S.; PAVLOVSKIY, S.I.; ZIL'BERSHTEYN, M.B.;
LYULENKOV, I.S.; NIKULINSKIY, I.D.; BRAGINSKIY, I.A.; SALOV, Ye.M.;
TROSHIN, N.F.; PETRIKEYEV, V.I.; ARGUNOV, M.I.; DUL'NEV, F.S.; BIDULYA, L.N.
GAYNANOV, S.A.; FROLOV, N.P.; VINICHENKO, V.S.; KOGAN, Ye.A.

G.E. Kazarnovskii; obituary. Stal' 15 no.8:757 Ag'55. (MLRA 8:11)
(Kazarnovskii, Grigorii Efimovich, 1887-1955)

KUCHKO, I.I., inzhener; SERKIN, M.G., inzhener; SOROKO, L.N., inzhener.

Efficient method of rail grooving. Stal' 16 no.5:438-445 My '56.
(MLRA 9:8)

1. Kuznetakiy metallurgicheskiy kombinat.
(Rolling (Metalwork))

137-58-1-596

K. N. L. N.
Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 94, (USSR)

AUTHOR: Soroko, L. N.

TITLE: Operating Experience with the Blooming Mill of the Kuznetsk Iron and Steel Mill (Opyt raboty na Blyuminge Kuznetskogo metallurgicheskogo kombinata)

PERIODICAL: Tr. Nauchno-tekhnicheskogo obshchestva chernoy metallurgii, 1956, Vol 10, pp 314-325

ABSTRACT: An analysis of the operation of the blooming shop of the KMK is presented. Particular attention is given to the procedures for soaking the blooms (in regenerator type pits), rolling procedures, repair to equipment, and maintenance thereof. Practical indices of the functioning of various portions of the shop are provided, as are recommendations for improving individual operations. Measures that have to be carried out to provide further increase in the capacity of the blooming shop are indicated (in 1954 it attained 220 percent of the design level). See RzhMet, 1957, Nr 12, 22805.

V.D.

Card 1/1 1. Rolling mills-Operation 2. Blooming mills-Operation

SOROKO, L.N.
 AUTHOR: GOLUBEV, T.M., SOROKO, L.N., ZAYKOV, M.A., KAFRANOV, M.P. PA - 2398
 CHELYSHEV, N.A., SAKHAROV, G.A., and ZUYEV, B.P., Siberian Metallurgical
 Institute and Metallurgical "Kombinat" of Kuznetsk (Sibirskyy
 metallurgicheskiy Institut i Kuznetskiy metallurgicheskiy kombinat).
 TITLE: The Stress and Power Indices of Rolling on Blooming Mill (Silovyye
 i energeticheskiye pokazateli prekatki na bluminge, Russian).
 PERIODICAL: Stal', 1957, Vol 17, Nr 2, pp 141 - 146 (U.S.S.R.)
 Received: 5 / 1957 Reviewed: 5 / 1957

ABSTRACT: Investigations were carried out when blooming railsteel and alloyed
 steel for ingots by means of rolls with a diameter of 1200 mm and
 with an effective length of the pieces of 2500 mm. The motor of
 5150 kW and M_d nominally - 100 t.m with a nominal armature current
 of 7050 A permitted a three treble sudden re-charge. The idling of
 the track, the process of blooming, quick rolling, the traction
 forces and moments occurring with rolling, the stress of the track-
 meter, and the specific energy consumption as well as the stress
 on the essential parts of the main track are described. The checking
 of the process while blooming showed the possibility of reducing the
 number of tappings and of edging for the purpose of equalizing the
 stress on the motor and the stress of the rollstands. An ample re-
 serve for the increase of the efficiency of the track is formed by
 the reduction of idling between tappings by means of acceleration and
 retardation in the case of all tappings by lowering of the speed

Card 1/2

...the safety factor
 publications). Illustrations, 6 tables and 2 citations

APPROVED FOR RELEASE: 08/23/2000

CIA-RDP86-00513R001652520004-6"

ASSOCIATION: Siberian Metallurgical Institute and Metallurgical Kombinat of
 Kuznetsk.
 PRESENTED BY:
 SUBMITTED:
 AVAILABLE: Library of Congress

Card 2/2

SOV/137-59-1-814

The Design of a Wide-path Cutting Blowpipe for Flame Cleaning of Metal

Smooth transition from the throat to the slot of the blowpipe is an essential consideration in the design of the nozzle.

G. K.

Card 2/2

SOV/133-58-6-18/33

AUTHOR: Soroko, L.N., Nefedov, A.A., Yershov, V.N., Masyukov, S.N. (Deceased), Frolov, N.P. and Braunshteyn, R.A.

TITLE: Rolling of Lightened Nr 19 Beam from Low Alloy Steel 09G2D (Prokatka oblegchennoy balki No 19 iz nizkolegirovannoy stali 09G2D)

PERIODICAL: Stal', 1958, Nr 6, pp 532 - 537 (USSR)

ABSTRACT: An experimental rolling of a lightened Nr 19 beam from low-alloy steel 09G2D (composition %: C \leq 0.12; Mn 1.4-1.7; Si 0.2-0.4; Cu 0.22-0.44; Cr \leq 0.30; Ni 0.01-0.03; S and P \leq 0.04) is described. Lightened Nr 19 beam (Figure 1) (TuTs 08-124-57) weighs 19.5% less per m than normal Nr 19 beam (GOST-5267-50) which is usually rolled from steel St3. For experimental rolling, four heats of steel 09G2D were made. Rolling was done on the mill 500 from shaped semis (Figure 2). The calibration of rolls is shown in Figure 3. The metal was heated from cold charging to an average temperature of 1170 °C. The decrease of temperature in the individual passes - Figure 4. The final temperature of the neck of the beam was 60 °C lower than that of normal beam. Frequency distribution of deviations of dimensions from the nominal ones - Figure 5. The comparison of the loads on the individual stands during rolling of normal and lightened Nr 19

Card1/3

SOV/133-58-6-18/33

Rolling of Lightened Nr 19 Beam from Low Alloy Steel 09G2D

beams together with the maximum permissible loads and rpm of motors - Table 1. The comparison of the mill throughput per hour during rolling normal and lightened Nr 19 beams - Table 2. Mechanical properties of specimens cut from various places of the beam - Tables 3 and 4. It is concluded that: 1) rolling of light Nr 19 beams on the mill 500 is possible with the existing equipment; 2) dimensions of the profile obtained were situated mainly in the range of minus tolerances; 3) the temperature of the neck at the end of rolling was 790 °C, i.e. 60 °C below the temperature obtained during rolling normal beam Nr 19; 4) loads on motors of roughing stands was 22-23% higher than during rolling of normal Nr 19 beam. Loads on the finishing stand either do not exceed or only slightly exceed permissible ones; 5) specific power consumption was 37% higher than during rolling normal Nr 19 beam from St.3 steel; 6) the output of the mill during rolling of the light beam decreases by 17%. It is expected that with mastering of the process, this decrease can be reduced to 8%; 7) the chemical composition and mechanical properties of 09G2D steel

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SOV/133-58-6-18/33

Rolling of Lightened nr 19 Beam from Low Alloy Steel 09G2D

satisfy the requirements of standard ChMTU-5688-56 for low-alloy steels. The following engineers participated in the work: N.I. Khoroshev, I.M. Sharapov and F.A. Firsakov. There are 5 figures and 4 tables.

ASSOCIATIONS: Kuznetskiy metallurgicheskiy kombinat (Kuznetsk Metallurgical Combine) and Ural'skiy institut chernykh metallov (Ural's Institute of Ferrous Metallurgy)

Card 3/3

1. Beams--Production 2. Rolling mills--Applications

22575

S/133/61/000/001/007/016

A054/A033

18.5100

AUTHORS: Chekmarev, A.P., Member of the Academy of Sciences USSR; Saf'yan, M.M., Candidate of Technical Sciences; Meleshko, V.M., Candidate of Technical Sciences; Soroko, L.N., Engineer; Kholodnyy, V.P., Engineer

TITLE: Heating the Finishing Stand Rolls of Wide Strip Mills

PERIODICAL: Stal', 1961, No. 1, pp. 43 - 46

TEXT: The frequent breakdowns of rolls in continuous and semi-continuous strip mills are a serious drawback for the increasing productivity of these machines. Breakdowns are mainly due to thermal stresses caused by the non-uniform heating of the rolls. Tests carried out to investigate this problem showed that the heat stresses depend largely on the degree of reduction, the temperature and the length of the strip and the speed of rolling. The thin surface layer of the rolls suddenly becomes heated to up to 102°C, when the strip enters and suddenly cools down when the strip leaves the roll. To eliminate the thermal stresses due to sudden temperature changes, the rate of rolling on the finishing stand in the Zavod Zaporozhstal' (Zaporozhstal' Plant) in the beginning of the working period

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22575

S/133/61/000/001/007/016

A054/A033

X

Heating the Finishing Stand Rolls of Wide Strip Mills

is decreased, e.g., the 1,680 mm stand of this plant produces 200 tons in the first hour after the rolls have been changed instead of 400 tons. In order to prevent heat stresses in the rolls and thus to eliminate production losses, the present article suggests the rolls to be preheated before operation to the temperature which corresponds to the normal rolling temperature on the particular stand. For this purpose an inductor has been designed, composed of three coiled cores, two of which are mounted under the roll, the third above it. The inductor is a-c fed (50 cps, 380 v). The rolls, the ball bearings and supports are connected with this device. In the working rolls of the finishing stand holes were drilled in which thermocouples (three pairs per roll) were fitted. The test results are plotted in Figures 4, 5, 6 and 7, and it was established that six pairs of the continuous finishing stand rolls could be preheated effectively, according to the following scheme. Four h before they are mounted on the stand the rolls of stands VIII - IX, then the rolls of stand VI and VII and finally those of stand V and X should be preheated by the inductor described. The heated rolls have to be wrapped in flannel and stored on shelves, so that the temperature will be distributed in them evenly, before they are mounted on the stand. The time available is 3 h for the rolls of stand VIII - IX, 2 h for those of stand VI - VII and 1 h for the rolls of stand V. The rolls of stand X, whose working tem-

Card 2/8

S/130/61/000/006/003/004
A006/A101

AUTHORS: Trishevskiy, I. S., Soroko, L. N., Naydenov, A. A.

TITLE: The production of cold-bent economical sections

PERIODICAL: Metallurg. no. 6, 1961, 20 - 23

TEXT: Information is given on experiences gathered in the manufacture of shaped sections at the "Zaporozhstal'" Plant. Two fully mechanized profile-bending units are now operating at the Plant, consisting of a set of machines for the preparation of blanks, shaping of bent sections, transportation and packing of finished products. The blanks are supplied in rolls to a defolder, straightened and cut with flying shears to gauged length. They are shaped between the rolls of the profile-bending machines, greased and packed. The sections are shaped by cold deformation in roll grooves, by gradual bending. The bent sections are produced from etched and non-etched hot and cold rolled strips with trimmed edges of the following steel grades: Cт (St.) 0, 3, 08, 10, 15, 20, 25, 30, (rimming and killed steels) 09Г2 (09G2) 10Г2 (10G2) 14ХГС (14KhGS) 15Х (15Kh) 20ХГС (20KhGS) HЛ -1 (NL-1) and HЛ-2 (NL-2). One of the profile bending machines is intended for the manufacture of diverse shaped sections from 2 - 8 mm thick and 80 - 500

Card 1/4

The production of cold-bent economical sections

S/130/61/000/006/003/004
A006/A101

the strips, so entailing deviations from prescribed dimensions. Special guide fixtures have now been designed (Figure 1) to prevent side displacement of the strips during shaping process. A difference in the width of section shelves will be eliminated by the use of new guide fixtures, which soon will become operative. Production by the piece of shaped sections is less efficient and qualified than continuous production. However, the latter method can presently not be employed on the described profile-bending machines due to the lack of devices which cut the finished sections in the line at a rate of 3 m/sec. In manufacturing by the piece, best results will be obtained by using small angles of bending the section components during the initial passes, which will then be increased and decrease again during the subsequent passes. Composite working rolls are employed at the Plant consisting of a shaft, bearing disks whose surfaces form the grooves (Figure 2). This design will make it possible to develop grooves for the manufacture of several groups of sections with one set of rolls. This is achieved by placing backing rings in the joints of disks of the upper and lower rolls. The use of multi-purpose groove systems is however, only possible at an equal transition radius of section dimensions of the same group. Presently, 17 types of sections are being manufactured at Zaporozhstal'. There are 3 figures.

ASSOCIATION: Ukrainskiy institut metallov (Ukrainian Institute of Metals) zavod "Zaporozhstal'" (Zaporozhstal' Plant).

Card 3/4

27930

S/133/61/000/009/004/011
A054/A127

1.1300

AUTHORS: Trishevskiy, I. S., Candidate of Technical Sciences, Soroko, L. N.,
Klepanda, V. V., Naydenov, A. A., Skokov, F. I., Gamershteyn, V. A.,
Kaluzhskiy, V. B., Engineers

TITLE: Grooving of rolls for the shaping of corrugated sheets

PERIODICAL: Stal', no. 9, 1961, 817 - 824

TEXT: According to the authors the best way of producing corrugated sheets is rolling them from sheet metal on shaping mills instead of producing them by stamping. The groove designs of the rolls for this process were made to suit the pilot industrial-scale shaping mill of the Ukrainskiy institut metallov (Ukrainian Institute of Metals). The tests were carried out with 08Kп (08kp) steel on 15 stands (scale 1:1). To ensure strip stability and a good quality corrugation, the design provides for the successive profiling of sectors, starting from the central rib towards strip edges. The ribs are shaped by the work rolls; before the first and second stand vertical auxiliary rolls are used as guides. One of the features of the new grooving system is the application of varying radii with a constant distance between the bending arc centers. The shaping radii are determined in such

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27930

Grooving of rolls for the shaping of corrugated sheets S/133/61/000/009/004/011
A054/A127

of the "Zaporozhstal'" Plant under the following conditions: I - feeding stand with cylindrical rolls; II-VII - stands: shaping the central rib with bending angles of 12° - 28° - 46° - 62° - $72^{\circ}30'$ - $72^{\circ}30'$; VIII-XI - stands: shaping the internal lateral edges of the small outer ribs with bending angles of 18° - 40° - 60° - $72^{\circ}30'$; XII-XV - stands: shaping the lateral edges of the small outer ribs with bending angles of 18° - 40° - 60° - 73° ; XVI-XVII - stands: shaping the longitudinal nick with bending angles of 35° - 71° ; XVIII - stand: doubling stand XVII. The authors conclude by stating that the grooving of shaping mill rolls for the production of corrugated sheets, based on a constant distance between the bending arc centers and on a variable magnitude of radii makes it possible to obtain shapes without cracks in the bending spots and without surface defects. There are 4 figures.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy institut metallov (Ukrainian Scientific Research Institute of Metals) and "Zaporozhstal'" Plant

Card 3/3

S/133/61/000/012/001/006
A054/A127

AUTHORS: Soroko, L.N.; Filonov, V.A.; Ksenzruk, F.A.; Tsirlin, B.M.; Pav-
lishchev, V.B.; - Engineers

TITLE: Test rolling of stainless steel slabs on the "1200" mill with
reelers in the furnace

PERIODICAL: Stal', no. 12, 1961, 1,092 - 1,096

TEXT: The possibility and the advantages of hot rolling stainless steel
slabs with double-phase structure on the "1200" reversing mill of the Novolipetsk
Plant were studied. The quality of surface and edges and the thickness differ-
ences (longitudinally and laterally) of the stainless steel slabs were compared
for the "1200" mill and a hot-rolling continuous sheet mill. 22 slabs made of
three heats of 1X18H9T (1Kh18N9T) and 2 steel grades of austenite-ferrite struc-
ture (A, 18 and B, 6 slabs), totalling 82 tons were rolled during the tests.
The slabs were heated in a pusher-type furnace, fuelled by blast-furnace gas.
The required heating time was originally fixed at 2 h 40 min, but actually this
period varied within wide limits, due to delays in rolling the strip on the fin-
ishing stand. The required rolling temperature and heating quality could be en-

Card 1/3

Test rolling of stainless steel slabs on

S/133/61/000/012/001/006
A054/A127

the continuous mill (0.05 - 0.19 mm and 0.07 - 0.17 mm, respectively). Due to the considerable fluctuations in thickness and temperature along the strip it is not reduced uniformly over its entire length and this results in waviness and warping. It was possible to eliminate these defects at the expense of the rolling speed, and, therefore, of the output. The quality of the edges and the surface was better for strips rolled on the "1200" reversing mill with the coils heated in the furnace. There were no cracks at the edges and surface defects of mechanical origin (scratches, grooves) were fewer than in the conventional strips. Hydraulic scale removal was not applied as it was feared to reduce the temperature of the strip ends. Due to this, however, the mill scale on the strip was rolled into the surface and, therefore, it was found more expedient not to use this measure. There are 3 tables.

ASSOCIATION: Zavod "Zaporozhstal'" ("Zaporozhstal'" Plant)

Card 3/3

CHEKMAREV, A.P., akademik; SAF'YAN, M.M., kand.tekhn.nauk; MELESHKO,
V.M., kand.tekhn.nauk; SOROKO, L.N., inzh.; KHOLODNYI, V.P., inzh.

7 Heating finishing mill rolls of a broad strip mill. Stal' 21
no. 1:43-46 Ja '61. (MIRA 14:1)

1. Institut chernoy metallurgii AN USSR, Dnepropetrovskiy
metallurgicheskiy institut i zavod "Zaporozh'ye." 2. AN USSR
(For Chekmarev).

(Rolls (Iron mills))

TRISHEVSKIY, I.S., kand.tekhn.nauk; SOROKO, L.N., inzh.; KLEPANDA,
V.V., inzh.; NAYDENOV, A.A., inzh.; SKOKOV, F.I.;
GAMERSHTEYN, V.A.; KALUZHSKIY, V.B.

Roll grooving for the shaping of ribbed plates. Stal' 21 no.9:
817-824 S '61. (MIRA 14:9)

1. Ukrainskiy nauchno-issledovatel'skiy institut metallov i
zavod "Zaporozhstal".
(Rolls (Iron mills))

SOROKO, L.N., inzh.; FILONOV, V.A., inzh.; KSENZUK, F.A., inzh.;
TSIRLIN, B.M., inzh.; PAVLISHCHEV, V.B., inzh. Prinimali
uchastiye: BABAKOV, A.A.; BOROVSKIY, V.V.; YASHCHENKO, B.V.;
LAZUTIN, A.G.; ZAVERYUKHA, A.Kh.; FRANTSEYUK, I.V.; ORLOVA, T.K.

Experimental rolling of stainless steel slabs on a 1200 mill
with coilers in the furnace. Stal' 21 no.12:1092-1096 D '61.
(MIRA 14:12)

1. Zavod "Zaporozhstal'" (for Soroko, Filonov, Ksenzuk,
TSirlin, Pavlishchev).

(Rolling mills—Equipment and supplies)
(Steel, Stainless)